ABSTRACT OF THE DISCLOSURE

A fully implantable cochlear prosthesis includes (1) an implantable hermetically sealed case wherein electronic circuitry, including a battery and an implantable microphone, are housed, (2) an active electrode array that provides a programmable number of electrode contacts through which stimulation current may be selectively delivered to surrounding tissue, preferably through the use of appropriate stimulation groups, and (3) a connector that allows the active electrode array to be detachably connected with the electronic circuitry within the sealed case. The active electrode array provides a large number of both medial and lateral contacts, any one of which may be selected to apply a stimulus pulse through active switching elements included within the array. The active switching elements included within the array operate at a very low compliance voltage, thereby reducing power consumption. The entire prosthesis is very efficient from a power consumption standpoint, thereby allowing a smaller battery to power the system for longer periods of time before recharging or replacement is required. The hermetically sealed case within which the electronic circuitry, battery, and microphone are housed may be replaced, when needed, through minimally invasive surgery. Further, the electronic circuitry housed within the hermetically sealed case may be programmed, as needed, using acoustic and/or RF control signals. In one embodiment, such control signals may be realized using phase-shift keyed (PSK) modulation of an acoustic signal within a very narrow frequency band centered at about 6KHz.